

ing the characters of the existing Indian species is of weighty import in the geographical distribution of Mammalia.

Dr. Leidy, in his general remarks upon the characteristics of the Niobrara fauna, observes that "One of the most remarkable circumstances, in relation with this extinct fauna, is that it is more nearly allied to the present recent one of the old world than to that of our own continent. From a comparison of our recent fauna and flora with that of the eastern continent, the deduction has been made, that the western continent is the older of the two, geologically speaking; whereas the Niobrara fauna would indicate just the reverse relationship of age. A number of similar instances show that totally different faunæ and floræ may be cotemporaneous, and do not necessarily indicate different periods of existence."

Dr. Leidy's enumeration and brief description of the genera and species (*op. cit.* pp. 20-29) is not in exact accordance with the tabular list given by Dr. Hayden, indicating their stratigraphical position (*op. cit.* p. 157). The Ruminant forms *Procamelus robustus* and *P. gracilis*, and the carnivorous *Leptarctus primus*, included by the latter, are omitted by the former. The list given above is founded on Dr. Hayden's enumeration, as being the later in date of publication, and probably embracing additional materials.—*Proc. Acad. Nat. Science of Philadelphia*, 1858.

*On a remarkable Form of Rotation in the Pith-cells of Saururus cernuus.* By GEORGE C. SCHAEFFER, M.D.

WHILE examining the intimate structure of various plants, I discovered, in the year 1854, a peculiar motion in some of the pith-cells of *Saururus cernuus*, which was so different from anything before described that it seemed to be quite abnormal. Continued observation for eight years has shown however that, for this plant at least, the phenomenon is constant, while an equally long-continued examination of the writers on such subjects has proved that no record of this appearance has ever been made. As a mere microscopical curiosity the fact might be deemed worthy of notice; but the remarkable similarity to a motion which has been considered as invariably connected with a distinct and peculiar vegetable function seems to render its record needful for the true advancement of vegetable physiology.

The *Saururus cernuus*, like many other aquatic or marsh plants, has a pith the cells of which are not in complete juxtaposition, but separated in part by vertical air-passages which are as regularly built around by the cells as a chimney is by its bricks, with this difference, however, that the cells are arranged directly one above another, and do not "break joint" as the bricks would in any properly constructed chimney: no fault in Nature's workmanship, we should remark, since the pith is a mere filling in, surrounded by a much denser and more solidly built structure.

The cells in which the above-mentioned motion occurs are not those from which the party-walls of each air-passage diverge, but

those forming the middle of the wall between any two contiguous channels ; they seem to be smaller and *younger* cells than the others.

In all ordinary cases of *cyclosis* the motion is along the walls of the cell, coming and going in paths which are, for the time at least, permanent. But in the *Saururus* the granules lie in the centre of the cells above described, and their motion is of a quite different character. To those familiar with microscopic observations, we may best describe this motion as perfectly identical with that seen in the so-called vesicles in the ends of *Closterium*, which has been aptly styled "swarming" by the English and Germans. The granules are quite minute, rounded in form, and rather unequal in size. Sometimes a cell is seen in which all motion has ceased ; in such cases the granules are always closely crowded together in the centre of the cell.

The time during which this motion continues is quite remarkable. Specimens of the plant kept for several days in water never fail to show it ; while the proper pith-cells of all parts of the plant, even of the blanched portions of the stem growing beneath the mud, seem equally active. Indeed, no form of *cyclosis*, of which this is undoubtedly one, is so easily demonstrated.

The nature of the granules, however, is not so readily determined ; for they do not show the starch-reaction with tincture of iodine, neither are they coloured as proteine-compounds (and such I had at first supposed them to be) would be under this reagent. There is, however, a remarkable difficulty, common also to many others, in applying chemical tests to sections of this plant ; and this consists in the rapid discoloration of the specimens, owing to the presence of tannic acid, which acts upon the iron of the cutting instrument. It is quite certain, however, that the granules are neither starch nor proteine ; whether they are the so-called aleurone I am unable to say.

To those familiar with the microscopic examination of freshwater algæ, this "swarming," apart from the best-known case of the *Closterium*, must be quite familiar ; but such motions have always been considered as in some way connected with sexual reproduction. In the case in question, however, nothing of the kind can possibly occur ; for the *Saururus* is, beyond a doubt, not only a phænogamous, but even a dicotyledonous plant, closely allied to the Pepper family. The cells in which this motion is seen are evidently smaller and younger than those in their immediate vicinity. Sometimes, indeed, two vertical rows of small cells show the same motion. The phenomenon in question would therefore merely indicate *active cell-multiplication*, and not *plant-reproduction*, to which similar appearances have always been referred. With a somewhat extensive experience I am able to say that nothing of the kind has before been observed in phænogamous plants ; yet it must be admitted that one single instance among them is sufficient to invalidate the inferences formerly drawn from algæ, as to the true meaning of this peculiar kind of motion.

I am more earnestly disposed to insist upon this apparently exceptional case, because it confirms views long held and taught by

myself as to the purely physico-chemical interpretation of most of the phenomena of vegetable life.—*Silliman's Journal* for Nov. 1862. Washington, D. C., September, 1862.

*Application of Magenta Dye in Microscopical Investigations.*

At a recent meeting of the Microscopical Section of the Literary and Philosophical Society of Manchester, Dr. Roberts called attention to the aid that might be received in the examination of the structure of animal and vegetable tissue by the use of colouring materials. Magenta is peculiarly adapted for this purpose, in consequence of its solubility in simple water and its inert chemical character. The nuclear structures of animal cells are deeply tinted by magenta; and by its use the nuclei of the pale blood-corpuscles, of pus-globules, of the renal and hepatic cells, and of all epithelial structures are brought out in great beauty, tinted of a bright carbuncle-red. The red blood-disks are tinted of a faint rose-colour, and a darker red speck, not hitherto noticed, is to be observed on the periphery of the corpuscle; it undergoes some changes when treated with tannin and subsequently with caustic potash, but this point is still under investigation.

*On a new Phyllodactylus from Guayaquil.* By W. PETERS.

*Phyllodactylus Reissii*, n. sp.

*P. tuberculorum dorsali* seriebus quatuordecim, granulis occipitis miuoribus quam sincipitis, scutello infralabiali primo mentali paulo minore; griseus, transversim nigro maculatus.

This species approaches very closely to *Phyllodactylus tuberculatus* of Wiegmann, from California, but differs from it in that, 1. the tubercles of the back, which are also triangular and keeled, stand in regular, not alternating, series; the interspace between these longitudinal series in the middle of the body is always greater than the tubercles themselves: 2. the occipital region does not, as in that species, exhibit roundish granules, larger than those upon the snout and between the eyes, but is covered by very small granules of uniform size: and, 3. the *mentale* lies almost entirely between the first dilated pair of *infralabialia*, whilst in both specimens of *P. tuberculatus* the first *infralabiale* is not broader than the following one, and two large, roundish, polygonal *submentalia* bound the posterior half of the *mentale*. In this new species, behind the *mentale* and between the first pair of *infralabialia*, there is a pair of small roundish scales, followed by a third small, median, round scale. In colour the two species appear to agree. The colour is grey, with irregular black spots, which, in a young specimen, form bowed transverse bands on the neck, and broad half-rings on the tail.

This species was discovered in the vicinity of Guayaquil, by the Prussian Consul, M. Carl Reiss, who has collected other remarkable reptiles in that locality. It is known by the Spanish name of "*Salamanquesa*."—*Monatsber. der Akad. der Wiss. zu Berlin*, November 1862.